COPY

51

Southern Nuclear Operating Company, Inc.
Post Office Box 1295
Birmingham, Alabama 35201-1295

Tel 205.992.5000

SOUTHERN COMPANY
Energy to Serve Your World™

September 15, 2000

Southern Nuclear Operating Company
NUPIC Joint Audit Report of
Holtec International
Marlton, NJ
File: Supplier/Holtec
Log: QSF 2000-64

Mr. Mark Soler
Quality Assurance Manager
Holtec International
Holtec Center
555 Lincoln Drive West
Marlton, NJ 08053

Dear Mr. Soler:

Attached is a copy of the subject audit report for your information. This limited-scope audit was conducted at the request of Southern Nuclear Dry Storage Project Management in consideration of the conclusions reached by the NUPIC Joint Audit Team. The audit team examined work activities on-going at Omni Fabricators for the purpose of assessing the scope of your program improvements and verifying corrective action implementation in response to the five Audit Finding Reports (AFR's) issued during the NUPIC Joint Audit.

There were no new AFR's issued during this audit and based on your earlier corrective actions submittal and a review of work at Omni Fabricators, the five AFR's issued during the NUPIC Joint Audit are closed. It is noted herein however, that while improvements in previously deficient areas is acknowledged, the nature and scope of your undertaking at Omni Fabricators continues to demand both frequent and direct utility oversight. The recommendations included in the correspondence do not require a written response. Your attention to the area of interest addressed within each recommendation will however, be the subject of further review in subsequent audits and/or surveillances.

The audit shall not operate to relieve the Holtec International of any of its responsibilities with respect to quality assurance or otherwise alter any responsibilities of Holtec International to Southern Nuclear Operating Company.

If you have any questions, please contact Mr. M. P. Craven at (205) 992-6429.

Sincerely,

W. R. Moody

W. R. Moody, Acting Manager
Corporate Quality Services

cmc

cc/att: QA Records

SOUTHERN NUCLEAR OPERATING COMPANY

Corrective Action Implementation Audit

of

Holtec International
Marlton, NJ
August 29-31, 2000

for

Design, Engineering and Fabrication Services for Wet and Dry Storage Systems, Heat Exchangers, Strainers and Engineering Support Services

CQS Quality Class: SR (Wet Systems)
AQ (Dry Systems)

QSF 2000-64
QSL No. 111601

Prepared by: M. P. Craven
Nuclear Specialist

Reviewed by: M.D. Rickels
Senior Engineer

Approved by: W.R. Moody
Senior Engineer

I. AUDIT SCOPE

A. Quality Levels

Quality Class SR (Wet Systems)
AQ (Dry Systems)

B. Items/Services

Supplier of Safety-Related Design and Engineering Services for Wet Storage Systems and Design, Engineering and Fabrication Services for Dry Storage Systems

C. Program Base(s)

Quality Assurance Manual Revision 11, dated 2/11/99

D. Checklist Used

NUPIC Dry Storage Checklist Revision 0 dated 2/24/99, Sections 5 and 6

II. AUDIT PARTICIPANTS

A. Auditors

M. Craven, Southern Nuclear, Lead Auditor
P. Norris, Technical Specialist, Southern Nuclear

B. Persons Contacted

M. McNamara	Vice President, Holtec 3
C. Singh	President, Holtec 3
M. Soler	QA Manager, Holtec 1,2 and 3
John Singh	President (Omni) 2
Victor Singh	Vice President (Omni) 2
Scott Davey	QC Manager (Omni) 2
Gregg Ruane	Resident Inspector (NYPA) 2

1 = present at entrance meeting
2 = contacted during audit
3 = present at exit meeting

III. GENERAL COMMENTS

Holtec International has moved aggressively to correct the deficiencies cited in the May NUPIC Joint Audit Report. It was apparent from a limited review of in-shop Production Work Routing Plans (PWRP's), Material Control Data Sheets (MCDS's), Inspection Report Data Sheets (IRDS's) and Assembly Data Sheets (ADS's) that a necessary focus on accurate and complete documentation had been emphasized. This is not to suggest a reduction in the need for frequent and direct Utility oversight. Work activity at Omni Fabricators during this audit was minimal. While component parts were staged for assembly, the number of qualified welders to support production is very limited. Weld Procedures still need to be qualified, as do welders. Employee experience at Omni Fabricators with the demands of a quality program mandated by the Nuclear Regulatory Commission is essentially non-existent.

IV. PROGRAM ACCEPTABILITY

The implementation of the Holtec quality assurance program at Omni Fabricators is acceptable. Again, it must be noted that on-going work activity was limited during this re-audit. Direct and frequent utility oversight is recommended until such time as Omni Fabricators has institutionalized the many new controls and processes required to support quality program conformance to procedural and regulatory requirements.

V. NONCONFORMANCE/OBSERVATIONS

There were no new Audit Finding Reports (AFR's) issued during this re-audit. Five observations are offered for consideration and will be the subject of subsequent audits and/or surveillances. These are:

1. Material traceability must be maintained as required both by procedural and regulatory requirements. Component and/or subassembly serialization must be unique to each individual and subdivided piece in order to assure the required traceability. The use of non-unique serialization is not acceptable and will result in the loss of material traceability.
2. The external audit program, used to qualify suppliers is weak. Audit reports must be sufficiently comprehensive and detailed to support conclusions of supplier acceptability.

3. Consumables purchased from unqualified stocking distributors must evidence that the items were shipped directly from the approved supplier as required by reviewed purchase orders.
4. Measuring and Test Equipment used for in-process acceptance inspections must be uniquely identifiable and be supported by required calibration records.
5. While not an audit element, industrial safety practices require attention. Multiple examples of work practices that could contribute to personnel injury were obvious during the shop walk-downs.

VI. SUPPLIER RESPONSE

The scope and results of this re-audit were discussed with Holtec's Quality Assurance Manager. A written response to this report is not required.

VII. ORDER ENTRY REQUIREMENTS

There are no unique order entry requirements.

VIII. FOLLOW-UP, PREVIOUS AUDIT(S)

This limited-scope audit examined the adequacy of corrective action implementation in response to five AFR's issued during the May NUPIC Joint Audit. As a result of the review, NUPIC Joint Audit No. 17148 (SNC QSF 2000-38) dated July 5th, is closed with no further corrective action required.

IX. NRC ISSUES

There were no NRC issues associated with this supplier since the date of the last NUPIC audit.

AFR Closeout

Southern Nuclear Operating Company
Corporate Quality Services
Audit Finding Report

AFR NUMBER: 2000-1

AUDIT DATE: 5/22-26/2000

Audited Organization	Responsible Manager/Supervisor
Holtec International	Mark Soler

Audit Topic	Auditor
Design	Oscar Shirani

Audit Finding Classification

☐ Represents a defect or failure to comply that could conceivably create a substantial safety hazard. Review for possible 10 CFR Part 21 reportability.

☑ Not reportable under Part 21.

Controlling Document: Holtec Quality Procedure HQP 3.1 Rev. 3 (Design Input Requirements)
HQP 3.2 Rev. 8 (Design Analysis)
HQP 3.3 Rev. 8 (Design Verification)
HQP 3.4 Rev. 0 (Design Specification and Design Criteria Documents)

Requirement: The above controlling documents (Design Procedures) have established measures for the determination, documentation, review, approval, and control of the basis for performing design activities in accordance with ANSI N45.2.11, NQA-1, 10CFR50 Appendix B, 10CFR71 Subpart H, and 10CFR72 Subpart G.

Holtec design procedures also require that only valid sources for design inputs be used such as: Nuclear facility's technical specification; Design specification provided by the client; Plant Safety Analysis Report (SAR); Design criterion document; Holtec reports and drawings; ASME Codes; Regulatory requirements; ACI; IEEE; and other industry standards.

Holtec design procedures also require that the design input is required to be validated prior to use. Design documents are reviewed and approved by lead engineer or project manager with a competent principal engineer's concurrence.

Finding: Contrary to the above QA Program requirements, the following discrepancies found in the corresponding design documents:

1. Holtec Report No. HI-961450, Holtec Project 70271 "Service Life Evaluation for Millstone Unit 1 Shutdown Cooler," Rev. 1.

- The analysis input data for the subject calculation was obtained from the P.O. 02007446, dated 1/30/97. Upon review, it is revealed that the exchanger specification sheet on which the tube data was given was dated Feb. 15, 1957. Whereas, the same exchanger specification sheet shown in the subject P.O. was dated June 3, 1967. The concern is that the design input used in the calculation might not be in agreement with the design requirements shown in the P.O.

- The initial cycles used in the calculation to establish the remaining life for the exchanger are 123 cycles, which is not in agreement with the number of initial cycles provided on the P.O. 02007446, dated 1/30/97.

2. Calculation No. HI-982037, Rev. 1, Holtec Project No. 80944 for Seismic/Structural Analysis of Byron and Braidwood Fuel Racks

- ASME Code Section III, Subsection NF used on this design calculation is documented in 11.11 of the reference section, which is later than the edition/addendum required by the Design Specification HI-982066 (Certified Design Specification for High Density Spent Fuel Racks for Byron Station Units 1 and 2, Braidwood Station Units 1 and 2). Code reconciliation between the two was not documented or approved by the Owner. Procedure for code reconciliation should be developed to mandate the code reconciliation when applicable.

The design and analysis of the safety-related or Important to safety systems, structures, and components (SSC) shall be in accordance with the Codes and Standards specified in the Owner's Design Specification, including the specific year of the Code, addendum, and revision. Any deviations from those specified in the owner's specification shall be approved by the Owner, or justified by performing the Code reconciliations to assure that the safety margins described in the Owner's FSAR are not impacted, and no unreviewed safety questions are resulted from using the later code standards. The code compliance issue is also applicable to the following: ACI-318, ACI-349, AISC, AISI, SRP-800, ANSI, NUREG, ASTM, etc. that may have been used in other design documents.

Note: The ASME Code Reconciliation for TMI Unit 1 SFP Reracking for GPU Nuclear, Holtec Report No. HI-992314, Rev. 2, dated 3/24/00 Project No. 90444 was performed by Holtec.

- The overhead storage was apparently qualified to 3 tons of metallic radwaste (P36), which is not in agreement with the design requirement of 4 tons (5.1(14) of HI-982066).

- The basis of using a temperature of 200°F to establish the rack material data is not documented (page 23 of the calculation).

3. HI-2002414, Assessment of Integrity of Pocket Trunnions – HI-STAR 100 Series No. 001- Program No. H-1020, Original Revision, dated 5/16/2000.

- No clear evidence was given to support that the CVN Value (10 ft/lbf) is bounded the value at -40°F, which is minimum operating conditions.

4. Holtec Report HI-2002419 Rev. 0, dated 5/17/00 Structural Analysis of Pocket Trunnion with Hypothetical Full Depth and Full Length Flaw- HI-STAR 100 Serial No. 001 for Southern Nuclear

- Page 12 – The stress limit factor of 1.5 is used for stress category of primary membrane plus bending. If the intent of SFs(1) or SFs(3) is to calculate safety factor for primary membrane stress, then a stress limit factor of 1 should be used.

- Page 7 – The projected area used to calculate the applied uniform pressure is inconsistent with the assumption used in the SAR (page 2.5-18), where the projected area is based on the diameter of the external trunnion shaft (D=6") and the length of engagement (L = 3.875").

- Page 7 – The projected area used to compute the applied uniform pressure for the transverse load case is not inconsistent with that used in the SAR (page 2.5-19), where the projected area is based on a quarter-circle contact to reflect the fact that the bearing load on the trunnion side wall is a point or line load. Consequently, the applied pressure load used to establish the stress profile in the trunnion side wall due to transverse load is not conservative, and perhaps the resulting stress should be double for structural evaluation.

Discussed With: Mark Soler

Recommended Corrective Action:

1. State the reason the noncompliance occurred.
2. State the immediate corrective action steps.
3. State the steps to be taken to prevent recurrence.

Corrective Action Taken or Planned (Include Dates)

See Holtec International correspondence dated June 7, 2000 provided as Attachment 1.

Audited Organization: _____ **Date:** _____

Verification/Close Out

See the enclosed audit checklist and Holtec response dated June 7, 2000.

Auditor: M.P. Gyorva **Approved by:** W.C. Moody **Date:** 9/15/2000

Southern Nuclear Operating Company
Corporate Quality Services
Audit Finding Report

AFR NUMBER: 2000-2

AUDIT DATE: 5/22-26/2000

Audited Organization	Responsible Manager/Supervisor
Holtec International	Mark Soler

Audit Topic	Auditor
Procurement	M. Craven/J. Disney

Audit Finding Classification

☐ Represents a defect or failure to comply that could conceivably create a substantial safety hazard. Review for possible 10 CFR Part 21 reportability.

☑ Not reportable under Part 21.

Controlling Document: ASME Section IX (QW463.1(b)

Requirement: The above controlling document requires that side bends be used for plate ¾" or more in thickness.

Finding: **Discussed With:** Mark Soler

Contrary to the above purchase order No. P1215-WPS 84 &85 dated 4-13-2000 specified face and root bends.

Recommended Corrective Action:

1. State the reason the noncompliance occurred.
2. State the immediate corrective actions taken.
3. State the steps taken to prevent recurrence.

Corrective Action Taken or Planned (Include Dates)

See Holtec International correspondence dated June 7, 2000 provided as Attachment 1.

Audited Organization: _____ **Date:** _____

Verification/Close Out

See the enclosed audit checklist and Holtec response dated June 7, 2000.

Auditor: M C Craven **Approved by:** W.C. Moody **Date:** 9/15/2000

Southern Nuclear Operating Company
Corporate Quality Services
Audit Finding Report

AFR NUMBER: 2000-3

AUDIT DATE: 11/15-19/99

Audited Organization	Responsible Manager/Supervisor
Holtec International	Mark Soler

Audit Topic	Auditor
Documented Instructions	D. Senner

Audit Finding Classification

☐ Represents a defect or failure to comply that could conceivably create a substantial safety hazard. Review for possible 10 CFR Part 21 reportability.

☑ Not reportable under Part 21.

Controlling Document: Holtec Quality Assurance manual

Requirement: Section 5.0 of the controlling document states in part, "Measures shall be established and documented to assure activities affecting quality of safety-related items or services are appropriately precribed in controlled instructions, procedures...Instructions, procedures, and drawings shall be prepared, reviewed, approved and distributed prior to the start of the activity."

Finding: **Discussed With:** Mark Soler

The review of the supporting Production Work Routing Plan (PWRP), Inspection Review Data Sheets (IRDS) and Assembly Data Sheets (ADS) for three ComEd completed packages, (ref. Holtec PO No. 9049BC to Omni) and completed Receiving Inspection Records (RIR) identified weaknesses with the documentation supporting inspection results. The following conditions were observed: 1) unacceptable inspection results were not recorded nor was a reference to the supporting NCR/SMDR listed on the inspection document, 2) M&TE traceability numbers were not always recorded on the IRDS, 3) applicable ECO's modifying inspection requirements were not listed on the IRDS as a basis for the acceptance of the item, and 4) uncalibrated M&TE was used to verify thread dimensions and not recorded on the receiving inspection record. It is noted that the lack of documented guidance and instructions on completing the PWRP's. IRDS's, ADS's and RIR's are considered to be a contributing factor for the numerous errors noted on the three completed packages. In addition, the receiving inspection procedure (HQP 7.0) lacks standardized guidance for the performance of receipt inspection of finished products (i.e., fasteners, fittings, etc.).

Recommended Corrective Action:

1. State the reason the noncompliance occurred.
2. State the steps to be taken to correct the deficiency
3. State the steps to be taken to prevent recurrence.

Corrective Action Taken or Planned (Include Dates)

See Holtec International correspondence dated June 7, 2000 provided as Attachment 1.

Audited Organization: _____ **Date:** _____

Verification/Close Out

See the enclosed audit checklist and Holtec response dated June 7, 2000.

Auditor: M C Senner **Approved by:** W. R. Moody **Date:** 9/15/2000

Southern Nuclear Operating Company
Corporate Quality Services
Audit Finding Report

AFR NUMBER: 2000-4 AUDIT DATE: 5/22-26/2000

Audited Organization	Responsible Manager/Supervisor
Holtec International	Mark Soler

Audit Topic	Auditor
Cleaning and Packaging	D. Senner

Audit Finding Classification

☐ Represents a defect or failure to comply that could conceivably create a substantial safety hazard. Review for possible 10 CFR Part 21 reportability.

☑ Not reportable under Part 21.

Controlling Document: Holtec Quality Manual Section 13.0

Requirement: The above controlling document requires in part that "Procedures shall be prepared for the cleaning, handling, storage and shipping of project materials to prevent damage or deterioration of all project items and components."

Finding: **Discussed With:** Mark Soler

Contrary to the above, no cleanliness or packaging requirements were defined by Holtec to Omni for the Dresden stainless steel upper and lower fuel spacers (reference Holtec Job No.'s 3400-602 and 3400-603). The fabrication packages only stated "Cleanliness (as required)." In addition, no independent quality verification of the cleanliness and packaging of the items was made prior to shipping.

Recommended Corrective Action:

1. State the reason the noncompliance occurred.
2. State the steps to be taken to correct the deficiency
3. State the steps to be taken to prevent recurrence.

Corrective Action Taken or Planned (Include Dates)

See Holtec International correspondence dated June 7, 2000 provided as Attachment 1.

Audited Organization: _____ **Date:** _____

Verification/Close Out

See the enclosed audit checklist and Holtec response dated June 7, 2000.

Auditor: mPlcoon **Approved by:** W.R. Moody **Date:** 9/15/2000

Southern Nuclear Operating Company
Corporate Quality Services
Audit Finding Report

AFR NUMBER: 2000-05

AUDIT DATE: 5/22-26/2000

Audited Organization	Responsible Manager/Supervisor
Holtec International	Mark Soler

Audit Topic	Auditor
Control of Special Processes	D. Senner

Audit Finding Classification

☐ Represents a defect or failure to comply that could conceivably create a substantial safety hazard. Review for possible 10 CFR Part 21 reportability.

☑ Not reportable under Part 21.

Controlling Document: Holtec Quality Procedure 2.2 Rev. 7
Requirement: The above controlling document states in part that "...welders and weld procedures shall be qualified in accordance with ASME Section IX."

Finding: **Discussed With:** Mark Soler

Contrary to the above, Welding Procedure Specification (WPS) 83 and 86 and the supporting Procedure Qualification Records (PQR) were not in full compliance with Section IX. Specifically, invalid ultimate tensile strengths were reported, test reports document that turned specimens were tested using a diameter in excess of that permitted by the Code.

Recommended Corrective Action:

1. State the reason the noncompliance occurred.
2. State the steps to be taken to correct the deficiency
3. State the steps to be taken to prevent recurrence.

Corrective Action Taken or Planned (Include Dates)

See Holtec International correspondence dated June 7, 2000 provided as Attachment 1.

Audited Organization: _____ **Date:** _____

Verification/Close Out

See the enclosed audit checklist and Holtec response dated June 7, 2000.

Auditor: M Clemons **Approved by:** W.C. Moody **Date:** 9/15/2000